Memorandum

To: **200/ Elka Forbes**

CC: **250/ Lori Levine**

From: **250/ Rebecca Ford**

Date: **July 29, 2008**

Re: **Drinking Water Sampling Results – Building 090**

Proxtronics Inc. conducted routine drinking water sampling for the Goddard Child Development Center (GCDC) Building 090 for analyses of Alkalinity, Bacteria, Free Available Chlorine, Chloride, Haloacetic Acids, Hardness, Metals, Nitrate, Orthophosphate, pH, Sulfate, Temperature, Total Dissolved Solids, Total Organic Carbon, and Total Trihalomethanes (TTHM) content. Samples were collected from the utility sink at GCDC. Environmental Scientists Alisha Sutton, Christine Liu, and Rebecca Ford conducted the sampling on June 19, 2008. All samplers are proficient in EPA drinking water sampling procedures.

Samples were collected in accordance with the Environmental Protection Agency (EPA) Sampling Process. Samples were sent to GPL Laboratories. GPL is certified by the State of Maryland to perform drinking water analysis.

A table is enclosed with all results from this sampling event and the corresponding standards. The following is an outline of parameters that did not meet the target:

- The pH was 8.67 and slightly above the Secondary Drinking Water Standard of 8.5. The high pH suggests that the water has a high alkalinity. High alkalinity present in the sample can cause aesthetic problems such as scale build-up in plumbing (with high levels of hardness), lowered efficiency of electric water heaters, and make the taste of water bitter. This factor does not pose a health risk.

- The TTHM was 88.1 ug/L and above the Primary Drinking Water Standard of 80 ug/L. Bromodichloromethane and Chloroform, constituents of TTHM, are common reaction byproducts when chlorinated water comes into contact with natural organics present in the water supply. Both components caused the maximum contamination level (MCL) for TTHM to be exceeded. Since these constituents can be a health concern, each was analyzed to determine the level of risk associated with them. Neither constituent was found to be at a level that posed a threat. See the following individual discussion of Bromodichloromethane and Chloroform for additional details.

- Bromodichloromethane was detected at 14 ug/L. Based on the *EPA 2006 Edition of the Drinking Water Standards and Health Advisories*, a child should not be exposed to any level higher than 1,000 ug/L per day. Also based on the advisories, the reference dose for an adult to be at risk is 3 ug/kg/day. An average

sized adult would have to drink 15 liters a day to reach this exposure level. From this analysis, Bromodichloromethane at this level does not pose a health risk.

- Chloroform was detected at 72 ug/L. Based on the *EPA 2006 Edition of the Drinking Water Standards and Health Advisories*, a child should not be exposed to any higher than 4,000 ug/L per day. Also based on these advisories, the reference dose for an adult to be at risk is 10 ug/kg/day. An average sized adult would need to drink more than 9.7 liters of water a day to reach this exposure level. From this analysis, Chloroform at this level does not pose a health risk.

- Orthophosphate is added to the water by the water provider, Washington Suburban Sanitary Commission, at a concentration of 1,000 ug/L in order to coat the distribution system piping. This helps prevent corrosion and the release of copper from pipes and fittings. The concentration was found to be 320 ug/L. This chemical is apparently consumed before reaching GSFC. This level may not be sufficient to prevent corrosion in the distribution system and may result in elevated levels of metals in the water. However, samples taken after flushing found the metals levels to be below the MCL and thus not a concern.

- The Langlier Index is an indication of the water's likeliness to corrode pipes and fittings. The Langlier Index was calculated to be 0.42 which indicates the water is considered balanced, neither corrosive nor scale forming.

Sincerely,

Rebecca R. Ford
Water Program Lead, Code 250
Proxtronics Goddard Team

Enclosure

Results of Quarterly Child Development Center Sampling

Date	Time	Bldg	Location	Analyte	Results	Standard and Type	
6/19/2008	11:20	090	Rm 106B - small utility sink	Alkalinity	40,000 ug/l	ug/l NA	Sample ID 20080619-090 Clips cracked in the Cl2 meter
				Bromodichloromethane	14 ug/l	80 ug/l P	
				Bromoform	<0.5 ug/l	80 ug/l P	
				Cadmium	<0.25 ug/l	5 ug/l P	
				Chloride	30,000 ug/l	250,000 ug/l S	
				Chloroform	72 ug/l	80 ug/l P	
				Copper	4.2 ug/l	1,000 ug/l S	
				Degrees C	22.8 degrees C	degrees C NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l NA	
				Dibromochloromethane	2.1 ug/l	80 ug/l P	
				Dichloroacetic Acid	5.5 ug/l	60 ug/l P	
				Fecal coliform	<1.1 CFU	CFU NA	
				Free available chlorine	90 ug/l	4,000 ug/l P	
				Haloacetic acids	26 ug/l	60 ug/l P	
				Hardness	77,000 ug/l	ug/l NA	
				Heterotrophic plate count	1 CFU	500 CFU P	
				Iron	50.8 ug/l	300 ug/l S	
				Langlier Index	0.42 units	NA	
				Lead	0.33 ug/l	15 ug/l AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l P	
				Nitrate	1,000 ug/l	10,000 ug/l P	
				Orthophosphate	320 ug/l	NA	
				pH	8.67 pH	6.5-8.5 pH S	
				Sulfate	8,000 ug/l	250,000 ug/l S	
				Total Coliform	<1.1 CFU	0 CFU P	
				Total Dissolved Solids	160,000 ug/l	500,000 ug/l S	
				Total organic carbon	2,000 ug/l	ug/l NA	
				Total trihalomethanes	88 ug/l	80 ug/l P	
				Trichloroacetic Acid	21 ug/l	60 ug/l P	
				Zinc	5.6 ug/l	5,000 ug/l S	

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P = Primary Standard S = Secondary Standard (Aesthetics) AL = Action Level NA = Not Applicable (No standard)